CLAIMS

What is claimed is:

5   1.   A method for configuring a microcontroller, comprising:

displaying a collection of virtual blocks in a design system with each

virtual block in said collection corresponding to a programmable block in said

microcontroller;

selecting a user module defining a function;

10   assigning a virtual block taken from said collection to said user module;

and

automatically constructing a source code table file comprising

configuration information for a programmable block of said microcontroller

corresponding to said virtual block wherein said configuration information is

15   used to cause said programmable block to implement said function.

2.   The method of Claim 1, wherein said function comprises a pulse

width modulator.

20   3.   The method of Claim 1, wherein said function comprises a timer.

4.   The method of Claim 1, wherein said function comprises an

analog-to-digital converter.

5.   The method of Claim 1, wherein said function comprises a digital-to-analog converter.

6.   The method of Claim 1, wherein said function comprises a

5   counter.

7.   The method of Claim 1, wherein said function comprises a signal amplifier.

10   8.   The method of Claim 1, wherein said function provides serial communication.

9.   The method of Claim 1, wherein said collection is displayed as a two dimensional array of programmable analog virtual blocks and

15   programmable digital virtual blocks.

10.   The method of Claim 1, wherein said assigning further comprises assigning a second virtual block to said user module.

20   11.   The method of Claim 1, wherein said code table file is an assembly code table file and further comprises:

a symbolic name for a register address in said programmable block.

12. The method of Claim 11 wherein said symbolic name is derived from said function.

13. A method of configuring a microcontroller having a programmable

5 block, said method comprising:

selecting a user module defining a circuit design;

assigning a virtual block in a design system where said virtual block corresponds to said programmable block; and

automatically constructing an assembly code file holding configuration

10 information for said programmable block to implement said circuit design.

14. The method of Claim 13, wherein said automatically constructing further comprises:

computing a register address for a register within said programmable

15 block;

determining a symbolic name for said register address; and

placing said symbolic name into said assembly code file.

15. The method of Claim 14, wherein said placing further comprises:

20 substituting said symbolic name for a generic name in a template file.

16. The method of Claim 13, wherein said automatically constructing

further comprises:

determining a symbolic name;

computing a register address for a register within said programmable block;

assigning said symbolic name to said register address; and

placing said symbolic name into said assembly code file.

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17.   A method of configuring a microcontroller having a programmable block, said method comprising:

selecting a user module defining a function;

assigning a virtual block in a design system where said virtual block

10   corresponds to said programmable block; and

automatically constructing an assembly code file with personalization information specifying said programmable block as performing said function.

18.   The method of Claim 17, wherein said automatically constructing

15   further comprises:

computing a register address for a register within said programmable block;

determining a symbolic name for said register address; and

placing said symbolic name into said assembly code file.

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19.   The method of Claim 18, wherein said placing further comprises:

substituting said symbolic name for a generic name in a template file.

20. The method of Claim 17, wherein said constructing further comprises:

determining a symbolic name;

computing a register address for a register within said programmable

5 block;

assigning said symbolic name to said register address; and

placing said symbolic name into said assembly code file.

21. A method of configuring a microcontroller having a programmable

10 block, said method comprising:

selecting a user module defining a function having a control parameter;

assigning a virtual block in a design system where said virtual block corresponds to said programmable block; and

constructing an assembly code file operating said control parameter

15 within said programmable block.

22. The method of Claim 21, wherein said constructing further comprises:

computing a register address for a register within said programmable

20 block;

determining a symbolic name for said register address; and

placing said symbolic name into said assembly code file.

23. The method of Claim 22, wherein said placing further comprises:

substituting said symbolic name for a generic name in a template file.

24. The method of Claim 21, wherein said constructing further comprises:

5   determining a symbolic name;

computing a register address for a register within said programmable block;

assigning said symbolic name to said register address; and

placing said symbolic name into said assembly code file.

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25. A method of configuring a microcontroller having a programmable block, said method comprising:

selecting a user module defining a function having a control parameter;

assigning a virtual block in a design system where said virtual block

15   corresponds to said programmable block;

constructing an assembly code routine using said control parameter; and

constructing a header file referencing said assembly code routine.

26. A computer system comprising a processor coupled to a bus and

20   a memory coupled to said bus, said memory containing instructions to

implement a method for configuring a microcontroller, said method comprising:

displaying a collection of virtual blocks in a design system with each

virtual block in said collection corresponding to a programmable block in said

microcontroller;

selecting a user module defining a function;

assigning a virtual block taken from said collection to said user module;

and

automatically constructing an assembly code table file holding

5   configuration information for a programmable block corresponding to said

virtual block to perform said function.

27.   The computer system of Claim 26, wherein said collection is

displayed as a two dimensional array.

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28.   The computer system of Claim 26, wherein said assigning further

comprises assigning a second virtual block to said user module.

29.   The computer system of Claim 26, wherein said assembly code

15   table file further comprises:

a symbolic name for a register address in said programmable block.

30.   The computer system of Claim 26 wherein said symbolic name is

derived from said function.

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31.   A computer implemented method of generating program

information for a programmable electronic device comprising:

a) selecting a user module, wherein said user module is defined by a

first data structure;

b) placing said user module within a hardware resource of said programmable electronic device, wherein said hardware resource is defined by a second data structure;

c) using said first and second data structures to automatically generate first source code for realizing said user module within said hardware resource; and

d) saving said first source code in a computer file.

32.   A method as described in Claim 31 further comprising:

e) selecting parameter values that define the behavior of said user module such that it operates in a prescribed manner;

f) automatically generating second source code, based on said parameter values, for causing said user module of said hardware resource to behave in said prescribed manner; and

g) saving said second source code in a computer file.

33.   A method as described in Claim 32 further comprising using said first and second source code to program said programmable electronic device.

34.   A method as described in Claim 33 wherein said programmable electronic device is a microcontroller.

35.   A method as described in Claim 31 wherein said a) and said e) are performed using a graphical user interface.